

REMARKS

Claims 1-6 are pending. Claim 1 has been amended, which is supported at least by the specification in page 7, lines 21-27; page 13, lines 25-29; page 22, lines 16-20 of the specification.

To clarify the claimed invention, claims 2-5 have been amended to recite “the hollow fiber membrane submodule.” Claims 3-6 have been made multiple dependent. Applicants respectfully submit that no new matter has been introduced.

Certified Copy of Priority Document

The Office Action states that the certified copy of the priority document has not been received by the USPTO. However, applicants note that, in the PCT Request filed along with the international application on September 25, 2003, Section VI-2 of the PCT Request already directed the Receiving Office to send a certified copy of the priority document to the International Bureau (please see a copy of the PCT Request submitted with this national phase application on February 3, 2006). Thus, the international application has complied with PCT Rule 17. Applicants request that the USPTO obtains the certified copy from the International Bureau per MPEP 1893.03(c).

Claim Rejections -- 35 U.S.C. 103

Applicants respectfully traverse the obviousness rejections of claims 1-6 under 35 U.S.C. 103(a) as being obvious over the combination of de Winter (US 6,183,639) and/or JP 2002-292213 and/or Eckman (US 5,470,469) and/or Collins et al (US 2002/0053540), and further in view of Nelle (US 5,018,238) or Hawkins et al (US 2003/0226798).

Claim 1, as currently amended, recites a hollow fiber membrane submodule installable into a pressure vessel wherein **removable** snaps arranged **non-continuously** around the outer peripheral surface of the permeated fluid collector and an end of the hollow fiber membrane element, securing the permeated fluid collector to the end of the hollow fiber membrane element, wherein the regions of the snaps serve to secure the hollow fiber membrane element at a central position within a pressure vessel, whereas the regions without a snap serve to ensure a flow path through which a concentrated fluid can pass.

Applicants respectfully submit that a *prima facie* case of obviousness has not been established because the Office Action does not articulate a reason to combine or modify the references to arrive at the claimed invention with reasonable expectation of success. There is no teaching or suggestion that the permeated fluid collector is secured to the end of the hollow fiber membrane element by removable snaps in a non-continuous manner.

The Office Action states that “one would use snap fit for such attachment for convenience as taught by Collins.” See page 4, lines 3-4. Collins merely discloses that the header caps 22 may be attached to the casing 12 by a snap-fit type construction (paragraph [0031]), but Collins does NOT teach or suggest that it is desirable to use a snap fit for convenience. Furthermore, Collins only discloses using snaps to connect the header caps to the outer casing but does not teach or suggest using removable snaps to secure the permeated fluid collector to the end of the hollow fiber membrane element, as recited in instant claim 1. Similarly, none of the other five references cited in the Office Action provides a motivation to achieve a hollow fiber membrane submodule comprising removable snaps securing the permeated fluid collector to the end of the hollow fiber membrane element, as recited in claim 1.

There would have been no reasonable expectation of success to achieve the claimed hollow fiber membrane submodule by using the latches of Nelle or Hawkins. Claim 1 recites: “a projection on one end of a snap is engaged in a depression provided in the end of the hollow fiber membrane element, and a projection on the other end of the snap is engaged in a depression provided in the permeated fluid collector.” Neither Nelle nor Hawkins discloses a snap that have projections at both ends. Rather, the latches of Nelle or Hawkins are pivotable. For Example, Fig. 11 of Nelle shows that the latch 91 is snapped into a notch 41, connecting the lid and the housing in a pivotable manner. See also Nelle, column 6, lines 5-8; Figures 12, 16, and 27. Similarly, the latch assemblies 16 and 19 of Hawkins include a first arm 32 that is “pivotally mounted” to a container 12 around a “pivot pin 36.” Fig. 1; paragraph [0026]. The pivotable latches of Nelle or Hawkins require a large space for installation and removal. On the other hand, the snaps of the present invention, which have projections at both ends and are not pivotally attached, do not require a large space. Because the snaps securing the permeated fluid collector to the hollow fiber membrane element in the claimed invention are located in a pressure vessel, the use of non-pivotable snaps is advantageous considering the spatial limitations. An ordinary skilled in the art would not use in a pressure vessel pivotable latches of Nelle or

Hawkins that require a large space because the use of pivotable latches would interfere with the filtering device during assembly and disassembly.

In addition, there is no teaching or suggestion that the snaps are removable as recited in claim 1. Citing *In re Dulberg*, the Office Action holds that the removable snaps recited in claim 1 would have been obvious over non-removable snap-latches disclosed by the Nelle or Hawkins reference. But the reasoning of *In re Dulberg* is not applicable to the present case. *In re Dulberg* held that a removable cap was obvious over a prior art cap which was “press fitted” because if it were considered desirable for any reason to gain access to the end of the prior art holder to which the prior art cap is applied, it would be obvious to make the cap removable. The reasoning of the *In re Dulberg* would not render the “removable snaps” recited in claim 1 obvious over the non-removable snap-latches of Nelle or Hawkins because the snap-latches of Nell or Hawkins already allow the end caps of the devices of Nelle or Hawkins to be removed to gain access to the interior of the devices of Nelle or Hawkins. Thus, it would not have been obvious to replace the snap-latches of Nell or Hawkins with removable snaps because the replacement would not change the access to the interior of the filtering devices of De Winter, Eckman, JP 2002-29213 and/or Collins et al. Thus, there is no motivation or desirable reason to replace the snap-latches of Nelle or Hawkins with removable snaps. Instead, there is a disincentive to replace the non-removable snap-latches with removable snaps because having the snaps removable can increase the chance of losing the snaps during long term use of a filtering device. Because the references do not disclose, explicitly or implicitly, each and every limitation of claim 1, a *prima facie* case of obviousness has not been established.

As discussed in the Response to Office Action filed February 19, 2009 (page 6, the third paragraph), none of the cited references discloses a hollow fiber membrane submodule comprises snaps arranged in a non-continuous manner around the periphery of the permeated fluid collector. Claim 1, as amended, recites the dual functions served by the non-continuous arrangement of the snaps: “the regions of the snaps serve to secure the hollow fiber membrane element at a central position within a pressure vessel, whereas the regions without a snap serve to ensure a flow path through which a concentrated fluid can pass.” There was no teaching or suggestion to modify the filtering devices of De Winter, Eckman, JP 2002-29213 and/or Collins by using removable snaps arranged in a non-continuous manner to secure the permeated fluid collector to the end of the hollow fiber membrane element, as recited in claim 1.

With regard to the snap materials, claim 4 recites a hollow fiber membrane submodule wherein the snaps are made of resin. These snaps are advantageous due to their light weight, low cost, and resistance to corrosion, even when in contact with sea water. Therefore, the claimed hollow fiber membrane submodule may be stably and reliably used for sea water filtration. On the other hand, the pivotable latches of Nelle or Hawkins should be made of metal due to the heavy load exerted on the latches, especially on the pin, i.e., the pivotal axis. If resin is used to make the pin of a pivotable latch, the pin must be made very thick to accommodate the heavy load on the pin. This would undermine one of the advantages of hollow fiber membrane modules, i.e., providing a large membrane area per volume of the module. Therefore, the teachings of pivotable latches in Nelle and Hawkins present a disincentive for using snaps made of resin, as recited in claim 4.

Applicants submit that De Winter, JP 2002-292213, Eckman, Collins, Nelle, and Hawkins, by itself individually, or even when taken in combination, fail to disclose the claimed hollow fiber membrane submodule wherein the permeated fluid collectors are directly secured to the hollow fiber membrane element with removable snaps arranged in a non-continuous manner. Further, there is no motivation or reasonable expectation of success to modify the filtering devices of De Winter, JP 2002-292213, Eckman, and/or Collins with the pivotable latches of Nelle or Hawkins. A *prima facie* case of obviousness has not been established. Withdrawal of the rejections of claims 1-6 under 35 U.S.C. 103(a) is respectfully requested.

CONCLUSION

The Examiner is encouraged to contact the undersigned regarding any questions concerning this amendment. In the event that the filing of this paper is deemed not timely, applicants petition for an appropriate extension of time. The Commissioner is authorized to debit Deposit Account No. 11-0600 the petition fee and any other fees that may be required in relation to this paper.

Respectfully submitted,

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